PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING

TEST 1

Winter Semester: 2021 - 22

Course Code: CIV2013

Course Name: Analysis of Determinate Structures

Program & Sem: B.Tech & IV Semester

Date: 25th April 2022

Time: 3.00 PM to 4.00 PM

Max Marks: 30

Weightage: 15%

Instructions:
 (i) *Read the all questions carefully and answer accordingly.*

Part A [Memory Recall Questions]

Answer all the Questions. Each question carries THREE marks. **(3Qx 3M= 9M)**

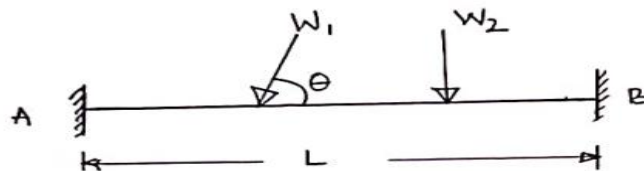Q.NO.1. What is the degree of indeterminacy of a fixed beam loaded as shown in fig - 1

Fig - 1

Q.NO.2. What is the degree of indeterminacy of a Propped Cantilever beam loaded as shown in fig - 2
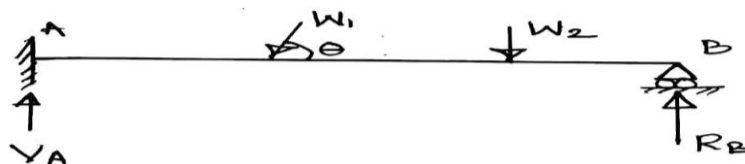

Fig - 2

Q.NO.3 What is the Kinematic degree of indeterminacy or degree of freedom of cantilever beam shown in the fig - 3 for inextensible member.
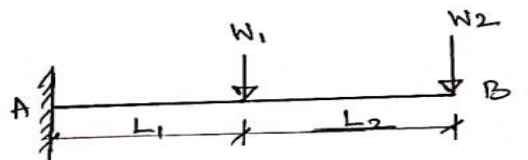

Fig - 3   (C.O.No.1) [Knowledge level]

Part B [Thought Provoking Questions]

Answer the Question. Question carries NINE marks. (1Qx9M = 9M)

Q.NO 4. The truss is designed for roofing elements for a workshop building and it subjected load as shown in the fig – 4. Identify the truss weather it is perfect or an imperfect truss. And also calculate the support reactions for the truss
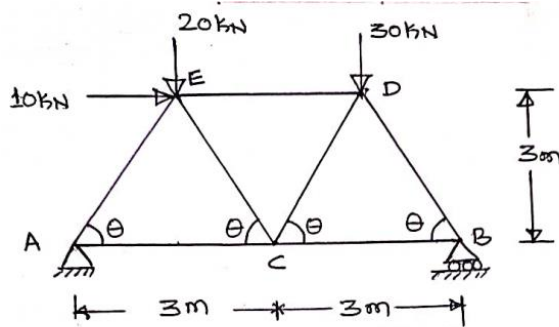

Fig - 4

(C.O.No.2) [Comprehensive level]

Part C [Problem Solving Questions]

Answer the Question. Question carries TWELVE marks. (1Qx12M=12M)

Q.NO. 5. Calculate the support reactions and determine forces in a members of truss marked 1, 2, & 3 by method of section.
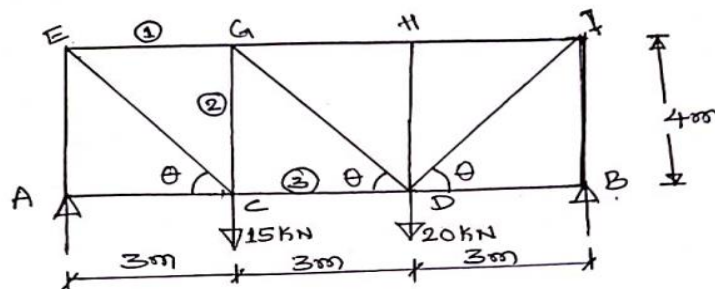

Fig - 5

(C.O.No. 3) [Application Level]

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING

TEST 2

Winter Semester: 2021 - 22

Course Code: CIV 2013

Course Name: Analysis of Determinate Structures

Program & Sem: B.Tech & IV Semester

Date: 31st May 2022

Time: 03:00 PM to 04:00 PM

Max Marks: 30

Weightage: 15%

Instructions:

(i)   Read the all questions carefully and answer accordingly.

Part A

Answer all the Questions. Each question carries ONE marks.   (4Qx 1M = 04M)

Q. NO. 1. If Portion of the beam is subjected to uniformly distributed load, then Bending moment varies _____

a) Linearly   b) Parabolic Curve   c) Cubical curve   d) None of the above

Q.NO. 2. The point at which bending moment is zero other than free end and it is called_____

a) Point of Contraflexture b) Mechanical Hinge   c) Plastic Hinge d) None of the above

Q.NO. 3. If the portion of the beam is subjected to uniformly Varying load, then SF varies _____.

a) Linearly   b) Parabolic Curve   c) Cubical curve   d) None of the above

Q. NO. 4. If the Shear force is zero or changing the sign at any section, corresponding section is subjected to maximum_____

a) Bending Moment   b) Shear Force   c) Thrust force   d) None of the above

(C.O.No.1) [Knowledge level]

Part B

Answer both the Questions. Each question carries SEVEN marks   (2Qx7M = 14M)

Q.NO. 5. Draw the SFD & BMD for a cantilever beam loaded as shown in the fig – 1 and calculate the support reaction.   (C.O.No.2) [Comprehensive level]
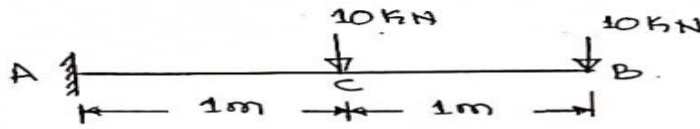
Fig - 1

Q. NO. 6. Draw the SFD & BMD for a simply supported beam loaded as shown in the fig – 2 and calculate the support reaction. (C.O.No.2) [Comprehensive level]
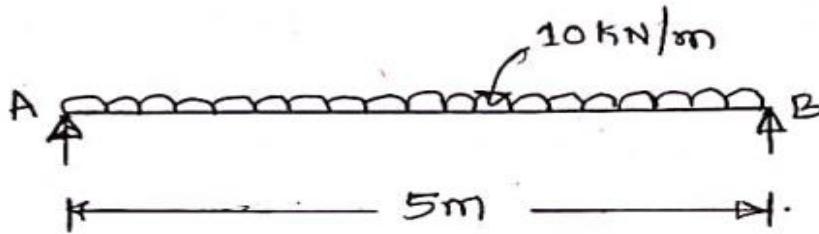

Fig - 2

Part C

Answer the Question and it carries TWELVE marks. **(1Qx12M = 12M)**

Q.NO. 5. Draw the SFD & BMD for a simply supported beam loaded as shown in fig - 3 and calculate maximum bending moment and its position.
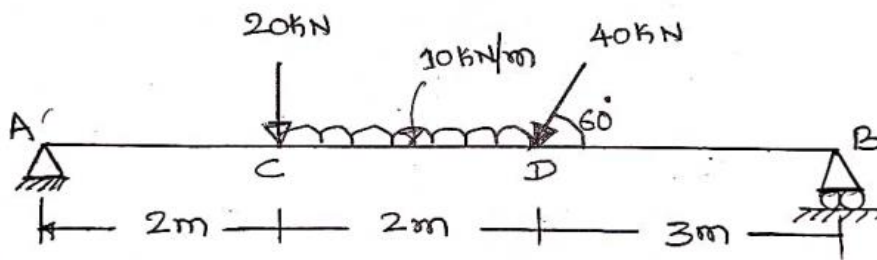
(C.O.No. 3) [Application Level]

Fig - 3

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING

END TERM EXAMINATION

Winter Semester: 2021 - 22

Course Code: CIV2013

Course Name: Analysis of Determinate Structures

Program & Sem: B.Tech (Civ) & IV Semester

Date: 28th June 2022

Time: 9.30 AM to 12.30 PM

Max Marks: 100

Weightage: 50%

Instructions:

(i)   Read the all questions carefully and answer accordingly.

Part A [Memory Recall Questions]

Answer all the Questions. Each question carries 02 marks.   **(10Qx 2M = 20M)**

1. How many conditions are available for non-concurrent system of force?
   a) 3   b) 2   c) 4   d) None of the above

2. Roller support has _____ number of components.
   a) 2   b) 3   c) 1   d) 4

3. If provided members in a truss are less than (2j – 3), then the truss is said to _____
   a) Perfect truss   b) Redundant Truss   c) Deficient truss   c) None of the above

4. If the suspension cable is subjected to UDL throughout the length, then name the nature of a force induced in the cable.
   a) Tension   b) Compression   c) Shear   d) Torsional

5. Eddy's Theorem states that, Bending Moment on an actual arch is directly proportional to _____intercept between the theoretical arch line of thrust and actual arch line of thrust.
   a) Horizontal   b) Vertical   c) Inclined   d) None of the above

6. Three hinged parabolic arch is _____structure
   a) Determinate   b) Indeterminate   c) Rigid   d) Over rigid

7. If Sher force is zero at any section, then what is magnitude of the bending at the same section?
   a) Zero   b) Minimum   c) Maximum   d) None of the above

8. Mohr's Second theorem is used to find _____
   a) Slope   b) Deflection   c) Deviation   d) None of the above

9. What is the magnitude of slope at fixed end for the cantilever beam?
   a) at Support   b) Zero   c) Maximum   d) None of the above

10. What nature of bending moment diagram over a simply supported beam when it subjected UDL through length?
   a) Sagging in nature   b) Hogging in nature c) Sagging & Hogging   d) None of the above

Part B [Thought Provoking Questions]

Answer all the Questions. Each question carries 10 marks.   **(5Qx10M = 50M)**

11. A symmetrical suspension cable of span 40mt and has central dip 5mt and it is subjected to uniformly distributed load of magnitude 20KN/mt through the length. Calculate the tensile force induced in the cable and also find the cross sectional area required for the cable. Take permissible stress in the cable material is 1200N/mm^2

(C.O.No.2) [Comprehensive level]

12. Calculate the support reactions and draw the bending moment diagram and shear force diagram for simply supported beam loaded as shown in fig – 1.
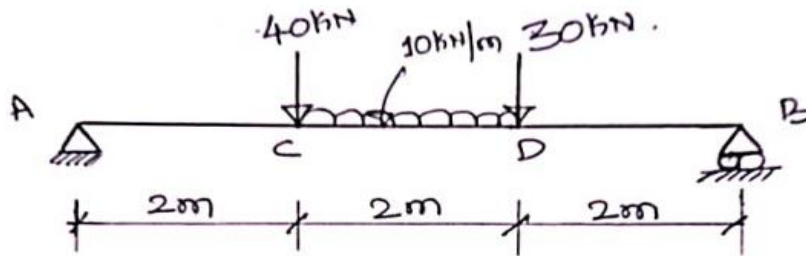
(C.O.No.2) [Comprehensive level]

Fig - 1

13. A three hinged symmetrical parabolic arch of span 50 mt and rise 10 mt is subjected to an axial load of magnitude 200KN at 12.5mt from left support as shown in the fig – 2. Find the reactions and draw the BMD.
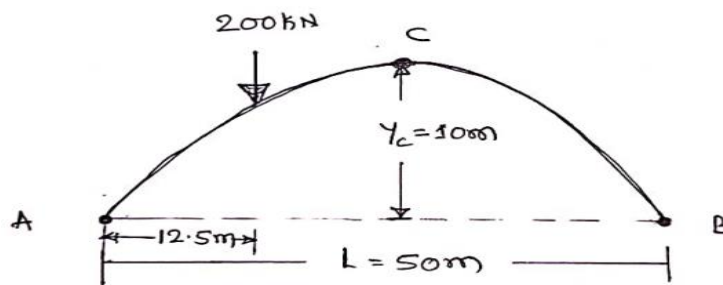
(C.O.No.2) [Comprehensive level]

Fig - 2

14. Calculate the maximum slope and deflection for a simply supported beam loaded as shown in fig – 3 by moment area method. Thake EI = 10.5X10^3 KNmt^2.
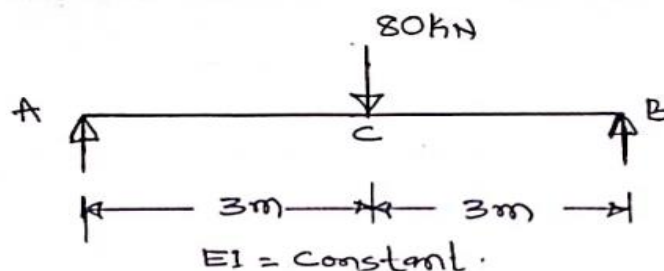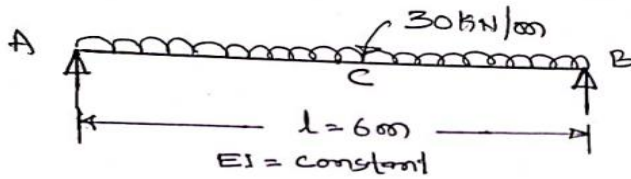
(C.O.No.2) [Comprehensive level]

Fig - 3

15. Calculate the maximum slope and deflection for a simply supported beam loaded as shown in fig – 4 by conjugate beam method. Thake EI = 10.5X10^3 KNmt^2 .

Fig – 4

Part C [Problem Solving Questions]

Answer both the Questions. Each equation carries 15 marks.   **(2Qx15M = 30M)**

16. Draw the SFD and BMD diagram for a simply supported beam loaded as shown in the fig – 5. Also find the maximum bending moment and its position.
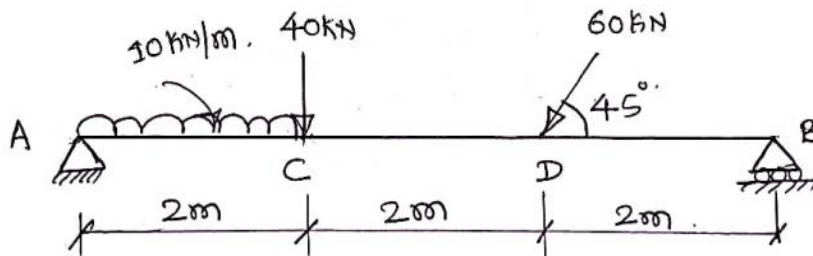
Fig - 5

17. A cable is supported on two piers at 50 mt apart at the same level has central dip of 7.5 mt and subjected udl of magnitude 20KN/mt throughout the length. Calculate the maximum tensile force in the cable and cross sectional area required for the cable, if permissible stress in the material is not to exceed 1200N/mm^2. Also determine the vertical force and maximum bending moment on the pie for the following supporting device on the pier. Take back stay is inclined at 60^0 to the vertical.

       a) The cable passes over a Pulley
       b) The cable passes over a Saddle.